CLAIMS

I claim:

1. An apparatus comprising:

a handle;

a flexible body portion coupled to the handle, the flexible body portion having dimensions suitable for insertion into and navigation through a body, the flexible body portion defining a lumen therethrough and having a distal portion and a proximal portion, wherein the proximal portion comprises

a flexible element disposed around the lumen, and

a braid disposed over the flexible element;

a first plastic coating impregnated into the proximal portion of the flexible body portion;

a second plastic coating impregnated into the distal portion of the flexible body portion;

an anchor element disposed in the distal portion of the flexible body portion; and

a tendon wire having a distal end coupled to the anchor element and a proximal end coupled to the handle such that manipulation of the handle results in deflection of the distal portion of the flexible body portion.

2. The apparatus of Claim 1 further comprising:

an electrical interface electrically coupled to the tendon wire, wherein the anchor element and the tendon wire each comprise electrically conductive material such that an instrument can receive an electrical signal from the tendon wire through the electrical interface.

3. The apparatus of Claim 1, wherein the anchor element comprises:

at least one of a ring and an electrode.

4. The apparatus of Claim 3, further comprising:

a third plastic coating, stiffer than the second plastic coating, disposed on an area just proximal to the anchor element.

5. The apparatus of Claim 1, wherein the flexible element is at least one of a coil and a second braid.

6. The apparatus of Claim 5, wherein the flexible element is one of a single coil and a multi-filar coil.

7. The apparatus of Claim 5, wherein the first braid is wound at an angle of approximately 55 degrees relative to a longitudinal axis of the flexible body portion.

8. The apparatus of Claim 1, further comprising:

a first piece of elastically deformable material disposed on a first area of the distal portion of the flexible body portion; and

a second piece of elastically deformable material disposed on a second area of the distal portion of the flexible body portion, the second area located approximately 180 degrees from the first area.

9. The apparatus of Claim 8, further comprising:

a coil of elastically deformable material coupled to each of the first and second pieces of elastically deformable material.

10. The apparatus of Claim 1, further comprising:

a second lumen defined by the flexible body portion; and

an elongate stabilizing member having a distal end, the stabilizing member to be disposed within the second lumen

such that the distal end of the stabilizing member protrudes therefrom such that the distal end of the stabilizing member may be placed in a position within the body to act as a reference point for the flexible body portion.

11. The apparatus of Claim 1, further comprising:

a location sensor disposed on the distal portion of the flexible body portion, the location sensor to indicate a position of the distal portion of the flexible body portion within the body by at least one of an electromagnetic mapping system, a radio frequency mapping system, and an ultrasonic mapping system.

12. The apparatus of Claim 1, further comprising:

an accelerometer disposed on the distal portion of the flexible body portion, the accelerometer to obtain information regarding cardiac tissue motion.

13. A substance delivery system comprising:

a guide catheter comprising

a handle;

a flexible body portion coupled to the handle, the flexible body portion having dimensions suitable for insertion into and navigation through a body, the flexible body portion defining a lumen therethrough and having a distal portion and a proximal portion, wherein the proximal portion comprises

a flexible element disposed around the lumen, and

a braid disposed over the flexible element;

a first plastic coating impregnated into the proximal portion of the flexible body portion;

a second plastic coating impregnated into the distal portion of the flexible body portion;

an anchor element disposed in the distal portion of the flexible body portion; and

a tendon wire having a distal end coupled to the anchor element and a proximal end coupled to the handle such that manipulation of the handle results in deflection of the distal portion of the flexible body portion; and

a needle catheter to be disposed within the lumen of the guide catheter such that a distal end of the needle catheter can protrude from an opening in the distal end of the guide catheter, the needle catheter comprising

a duplex spring impregnated with a third plastic coating,

a braided shaft disposed over the duplex spring,

a needle coupled to an inner diameter of the duplex spring,

an electrode coupled to the distal end of the needle catheter, the electrode having an opening through which the needle is movable between a retracted position and a deployed position,

an electrical insulator disposed between the needle and the electrode, and

a needle control assembly comprising

an elastically deformable element coupled to at least one of the duplex spring and the braided shaft of the needle catheter, and

a release mechanism which releasably engages the elastically deformable element when the elastically deformable element is in a position which corresponds to the needle being in the retracted position.

14. The substance delivery system of Claim 13 further comprising:

an electrical interface electrically coupled to the tendon wire, wherein the anchor element and the tendon wire each comprise electrically conductive material such that an instrument can receive an electrical signal from the tendon wire through the electrical interface.

15. The substance delivery system of Claim 13, wherein the anchor element comprises

at least one of a ring and an electrode.

16. The substance delivery system of Claim 15, further comprising:

a fourth plastic coating, stiffer than the second plastic coating, disposed on an area just proximal to the anchor element.

17. The substance delivery system of Claim 13, wherein the flexible element is at least one of a coil and a second braid.

18. The substance delivery system of Claim 17, wherein the flexible element is one of a single coil and a multi-filar coil.

19. The substance delivery system of Claim 17, wherein the first braid is wound at an angle of approximately 55 degrees relative to a longitudinal axis of the guide catheter.

20. The substance delivery system of Claim 13, further comprising:

a first piece of elastically deformable material disposed on a first area of the distal portion of the flexible body portion; and

a second piece of elastically deformable material disposed on a second area of the distal portion of the flexible body portion, the second area located approximately 180 degrees from the first area.

21. The substance delivery system of Claim 20, further comprising:

a coil of elastically deformable material coupled to each of the first and second pieces of elastically deformable material.

22. The substance delivery system of Claim 13, further comprising:

a second lumen defined by the flexible body portion; and

an elongate stabilizing member having a distal end, the stabilizing member to be disposed within the second lumen such that the distal end of the stabilizing member protrudes therefrom such that the distal end of the stabilizing member may be placed in a position within the body to act as a reference point for the flexible body portion.

23. The substance delivery system of Claim 13, further comprising:

a location sensor disposed on the distal portion of the flexible body portion, the location sensor to indicate a position of the distal portion of the flexible body portion within the body by at least one of an electromagnetic mapping system, a radio frequency mapping system, and an ultrasonic mapping system.

24. The substance delivery system of Claim 13, further comprising:

an accelerometer disposed on at least one of the distal portion of the flexible body portion and a distal portion of the needle catheter, the accelerometer to obtain information regarding cardiac tissue motion.

25. The substance delivery system of Claim 13, wherein the elastically deformable element comprises:

a spring.

26. The substance delivery system of Claim 25, wherein the release mechanism comprises:

a housing having the spring disposed within the housing;

a stop disposed within the housing, distal to the spring, and coupled to at least one of the duplex spring and the braided shaft of the needle catheter;

a first latch pivotally coupled to the housing and having a movable portion biased towards the housing, the first latch having an angled portion and a flat portion, the flat portion to engage the stop when the needle is in the retracted position; and

a second latch pivotally coupled to the housing and having a movable portion biased towards the housing, the second latch to releasably engage the first latch when the flat portion of the first latch is in contact with the stop in order to prevent the first latch from releasing the stop.

27. The substance delivery system of Claim 13, further comprising:

a reference electrode coupled to at least one of the distal portion of the guide catheter, a distal portion of the needle catheter, and an outer surface of the body

28. A method comprising:

inserting a substance delivery system into a body, the substance delivery system comprising a guide catheter and a needle catheter, the needle catheter having a needle movable between a retracted position and a deployed position, a needle shaft assembly, an elastically deformable element coupled to a portion of the needle shaft assembly, and a release mechanism that releasably engages the elastically deformable element when the elastically deformable element is in a position which corresponds to the needle being in the retracted position;

moving the substance delivery system to a desired position within the body;

setting the release mechanism to hold the needle in the retracted position;

releasing the release mechanism when the substance delivery system is in a desired position for insertion of the needle into a portion of the body.

29. The method of Claim 28, wherein inserting comprises:

inserting the guide catheter into the body; and

inserting the needle catheter into the guide catheter.

30. The method of Claim 28, further comprising:

injecting a substance into the body through the needle.